

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
1 August 2002 (01.08.2002)

PCT

(10) International Publication Number  
WO 02/059452 A1

(51) International Patent Classification<sup>7</sup>: E21B 33/00

(21) International Application Number: PCT/GB02/00362

(22) International Filing Date: 28 January 2002 (28.01.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0102023.9 26 January 2001 (26.01.2001) GB  
0102526.1 1 February 2001 (01.02.2001) GB

(71) Applicant (for all designated States except US): e2 TECH LIMITED (GB/NL); Shell International B.V., P.O. Box 384, NL-2501 CJ The Hague (NL).

(72) Inventor; and

(75) Inventor/Applicant (for US only): THOMSON, Neil (GB/GB); 84 Cornhill Road, Aberdeen AB25 2JH (GB).

(74) Agent: MURGITROYD & COMPANY; 165-169 Scotland Street, Glasgow G5 8PL (GB).

(81) Designated States (national): AE, AG, AI, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, L.C, LK, L.R, L.S, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

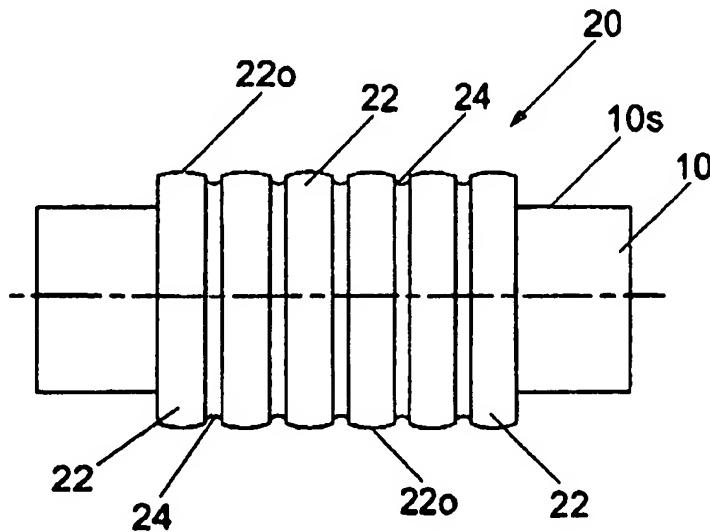
(84) Designated States (regional): ARIPO patent (GH, GM, KE, L.S, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CI, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NI, SN, TD, TG).

## Published:

- with international search report  
before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: DEVICE AND METHOD TO SEAL BOREHOLES



WO 02/059452 A1

(57) Abstract: Apparatus and methods are described that are particularly suited for creating a seal in a borehole annulus. In one embodiment, an outer surface 10s of an expandable conduit (10) is provided with a formation (20) that includes an elastomeric material (e.g., a rubber) that can expand and/or swell when the material comes into contact with an actuating agent (e.g., water, brine, drilling fluid etc.). The expandable conduit (10) is located inside a second conduit (e.g., a pre-installed casing, liner or open borehole) and radially expanded. The actuating agent can be naturally occurring in the borehole or can be injected or pumped therein to expand or swell the elastomeric material to create the seal.



*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*